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Recommended Citation
Chen, Yifan; Salmanian, Wolfram; and Akram, Asif, "User Acceptance In Sharing Economy - A Study Of Transportation Network Companies In China" (2017). *MCIS 2017 Proceedings*. 24.
http://aisel.aisnet.org/mcis2017/24

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USER ACCEPTANCE IN SHARING ECONOMY - A STUDY OF TRANSPORTATION NETWORK COMPANIES IN CHINA

Research full-length paper

Track 11 – Digital Markets

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Abstract

User acceptance research has been one of the most prominent topics in the field of information systems. The phenomenon has been researched for many digital technologies in various contexts. This study will focus on user acceptance of digitally-embedded Transport Network Companies (TNCs) in China. The sheer size and uniqueness of the Chinese mobile economy fostered rapid development of sharing economy firms. The state of the art UTAUT2 model has been used in this research with an explanatory purpose and deductive approach to explain the user acceptance of TNC in China. Each of the individual factors of UTAUT2 have been individually tested with Simple Linear Regression to determine their influence on user acceptance. These calculations were executed upon quantitative data from an electronically distributed survey. The finding provides insights of user acceptance of mobile digital technologies. Upon analysis of the findings, research and practical implications have been drawn. For example, the findings provide guidance to the emerging market of TNC by providing managerial recommendations for how TNCs can raise user acceptance and market share.

Keywords: user acceptance, sharing economy, transportation network companies, UTAUT2, Uber, DiDi

1 Introduction

Over the past few decades, digitalization of products and services is changing the contemporary landscape of various business sectors related ranging from product to services (Akram, 2016). One of the significant research phenomenon of research as the result of digitalization is how researchers can accurately and correctly shed light on the user acceptance of a technology (Delone & Mclean, 1992). The willingness to use innovative technologies including the perception, expectation, intention to use and actual use behavior determines user acceptance (Davis et al., 1989; Venkantesh et al., 2003). This user acceptance, in general, has been investigated to explain the adoption of a many different emerging technologies, services and innovations (Straub, Limayem & Karahanna-Evaristo, 1995; Anderson, Schwager & Kerns, 2006; Gupta, Dasgupta & Gupta, 2008). As the emergence of the technologies spans from early computer systems to modern mobile devices and applications, new theories were elaborated correspondingly. The-state-of-the art model UTAUT2 is an example of explaining user acceptance of mobile technologies and internet (Venkatesh et al. 2012).

With mobile internet users surpassing one third of the world's population (eMarketer, 2016), this innovative connectivity give rise to a new mode of economy known as 'sharing economy' (Belk, 2013). The "Sharing" in the sharing economy describes the use and access of shared physical or human resources or assets. A very prominent example of this sharing economy company is Uber and can be categorized as the part of transportation network company (TNC). The evolution of TNCs is dependent on distinct characteristic of various markets, especially China.

Mobile technology in general and as a part of TNCs has revamped China's society and economy. The large Chinese market has been appealing to many international tech giants such as Amazon, Facebook and Google, yet they all failed to take root in there (Isaac, 2016). However, Uber being ambitious for the Chinese market fought a notorious war against local competitor DiDi in TNC market. The immense valuation of these two companies and the billions they burnt emphasize not only the value of TNC market but also the intense competition within the market. According to the China Internet Network Information Center (2017), Chinese TNC users has exceeded million and is still growing at an ample pace. All these factors, make us interested to explore why Chinese users are susceptible to sharing economy, and particularly TNC.

The competition between Uber and DiDi for acquiring the Chinese market is an example of user acceptance of TNCs. Although different sources provide figures related to Chinese TNC users and rides, the understanding related the actual implications for the users who actually used TNC is missing. In this study, the user acceptance of TNC includes the 'intention to use' and the 'actual use' of both the TNC mobile applications and services by Chinese consumers. Being a novel and recent research phenomenon, there is very little research, if any, who have studied the user acceptance of TNC in China. Thus, this study aims to contribute to the understandings related to the user acceptance of TNC in China. The sheer size and uniqueness of the Chinese mobile economy as well as the disruptive (McGregor, Brown & Glöss, 2015) TNCs make it an interesting case to investigate the phenomenon in China. Therefore, we pose the following question in this paper: *What are the factors and in what manner do these factors impact the user acceptance of transportation network companies (TNCs) in China?*

To answer the research question, we proceed as follows: We shed light on the existing literature related to user acceptance and sharing economy in the next section. This literature review is followed by research approach and method describing data collection and analysis strategies. Then, the results of the analyzed data will be presented. The paper is concluded by discussing the implications for research and practice together with providing guidelines for future research.

2 Literature Review

2.1 User Acceptance

User acceptance is derived from the willingness of a person to use a new technology according to his or her perception, expectation and intention of the actual behavior (Davis et al. 1989; Venkatesh et al. 2003, Straub, 1995). User acceptance research has been one of most important topics within information system field, along with development of modern technologies, innovations or services such as mobile services, mobile commerce, E-services, wearable technologies or social network sites (Carlsson, Carlsson, Hyvonen, Puhakainen & Walden. 2006); AlKhunaizan & Love, 2012; Al Imarah, Zwain & Al-Hakim, 2013; Gao, Li and Luo, 2015; Herrero, Martín & Salmones, 2017. We define user acceptance as equivalent with technology acceptance in terms of the same explanatory ability on perceptual and emotional aspects which result in a person to finally accept a mobile app, digital service or other form of technological products. Hence user (technology) acceptance equals technology acceptance (by users).

Prior user acceptance researches build on constructs mostly from study field of sociology and psychology (Ajzen, 1985; Bandura, 1977; Drucker, 1954; Fishbein & Ajzen, 1975; Triandis, 1977). A most consistent and significant construct among is namely behavioral intention which is also verified in the information system field as a predictor of acceptance as well as a determinant that directly link to actual technology use. A significant amount of existing research has focused on identifying behavioral intention (e.g. Ajzen, 1991; Compeau and Higgins, 1995a, 1995b; Davis et al. 1989; Taylor & Todd. 1995; Venkatesh et al. 2003) and technology use (e.g. Straub et al., 1995; Burton-Jones and Straub, 2006). Straub et al. (1995) highlighted the information technology use as the acceptance of an IT system by individuals is of importance in the information system field. That is to say, technology use, also equivalently known as technology implementation (Saga & Zmud, 1994) and technology adoption (Jasperson et al. 2005), is fundamentally crucial in achieving information system success. As stated by Burton-Jones and Straub (2006), technology use has been conceptualized and operational- ized as extent of use (Venkatesh and Davis ,2000), breadth of use (Saga and Zmud 1994), variety of use (Igbaria, Zinatelli, Cragg & Cavaye, 1997; Thong, 1999), users' cognitive absorption into the system (Agarwal

and Karahanna, 2000).

In this study of TNC in China, users are identified as the role of customers due to that the users of TNC are in reality the fee-paying passengers of the TNC services and would be needed to rate the drivers after end of a ride. Having used TNC is a prerequisite for defined users in this study because TNCs in China has been operating successfully and developing rapidly in a large number of cities and covered majority of population now since 2013. It is not something new for Chinese users. Therefore, synthesis above, we define user acceptance of TNC in this research equivalently with joint "intention to use TNC" and "actual usage of TNC".

2.2 Sharing Economy and TNC

"Uber, the world's largest taxi company, owns no vehicles. Facebook, the world's most popular media owner, creates no content. Alibaba, the most valuable retailer, has no inventory. And Airbnb, the world's largest accommodation provider, owns no real estate. Something interesting is happening." (Goodwin, 2015). This frequently cited quote from Goodwin implies that there has been a major disruption through the sharing economy. A consensus about sharing economy's activities in current literature does not exist (Codagnone & Martens, 2016). There are many synonyms used such as access-based (Belk, 2014), collaborative (Botsman & Rogers, 2010) or connected consumption (Schor, 2014). PriceWaterhouse-Coopers defines that sharing economy allows access to tangible and intangible assets through digital platforms. Access instead of ownership. (PwC, 2015). Access economy means providing consumers cost efficient and convenient access without need for ownership. (Bardhi & Eckhardt, 2012). Three categories of sharing economy are listed by the OECD (2016); crowdsourcing, P2P sharing and selling. In general, the sharing economy is described by the OECD as matching supply and demand through P2P. Puschmann and Alt (2016) sub-classify P2P into business-to-business (B2B), business- to-consumer (B2C) and consumer-to-consumer (C2C) transactions. B2B and B2C have been around for a longer time, in applications such as agricultural machine sharing, self-service laundries, libraries and car rental. C2C has recently become prevailing. Strategically it links consumers directly or through an access-based intermediary. As producers are also consumers the distinction between them disappears (Puschmann & Alt, 2016). The sharing economy consists according to Hamari, Sjöklind and Ukkonen (2015) out of four characteristics: online collaboration, social commerce, sharing online and consumer ideology. The sharing economy is a technological phenomenon enabled by availability of connectivity through mobile devices (Benkler, 2007). Hence mobile technology like the availability of smartphones with apps are the backbone of the sharing economy business models by allowing low- cost scaling, networking and information exchange. Activities of the sharing economy consist of recirculation of goods, exchange of services, social connections, sharing or productive assets and increased utilization of assets according to Codagnone & Martens (2016). Concluding it can be said that several descriptions of the sharing economy exist and although they vary in terms of sharing economy's boundaries, the meaning is similar: IT-enabled organizations which cut middlemen and can make consumers to producers. How commercial or non-commercial these organizations are and if organizations within these two directions should have different names is a philosophical question.

Transportation Network Companies (TNCs) can be regarded as an industry of the sharing economy that focuses on personal transportation. Subsequently the description of TNC will be elaborated. As an effort from the authorities to regulate the new phenomena of ride sharing by companies, such as Uber and Lyft, a new term was created in 2013 and soon adopted broadly in legislation (AAMVA, 2017) as transportation network company. According to the Connecticut General Assembly the definition of a TNC is the following: "The bill defines a "transportation network company" as an […] organization, that provides prearranged transportation services by means of a digital network or app that connects passengers to TNC drivers providing TNC services. The definition does not include a taxicab or for-hire vehicle owner" (Connecticut General Assembly, 2015). The definition clearly differentiates peer-to-peer (P2P) digital transportation platforms from traditional taxis and rental cars. The TNC driver performs the service with an owned or leased vehicle, but not a taxi or rental car. Starting point and destination of the trip have to be predefined in the mobile app or website by the passenger. (Connecticut General Assembly, 2015).

Sharing Economy businesses success rely strongly on network effects (Frenken & Schor, 2017; Choudary, Parker & Alstyne, 2016). For TNCs demand leads to more drivers signing up, letting TNC software optimize and expand the area of coverage. This higher density of drivers leads to even shorter

waiting times, increasing demand, as the TNC gets more attractive to customers. This also leads to lower idle times of drivers and possibly lower prices, which also stimulate demand. It's a reinforcing loop of network effects. (Chen, n.d.; Fang, Huang & Wierman, 2017; Gurley, 2014)

3 Theoretical Framework

The Unified Theory of Acceptance and Use of Technology (UTAUT) was developed by Venkatesh et al (2003) synthesized from eight prior significant theories regarding behavioral intention and user behavior such as Theory of Reasoned Action (TRA), Theory of Planned Behavior (TPB), Technology Acceptance Model (TAM), The model of PC utilization (MPCU), Innovation Diffusion Theory (IDT), Motivational Model (MM), Social Cognitive Theory (SCT) and Combined TAM and TPB (C-TAM-TPB) (Venkatesh et al. 2003). Nine years after UTAUT model succeeded, there is an increasing need for UTAUT to enlarge its theoretical generalizability to address the new technology accordingly. Hence, Venkatesh et al. (2012) proposed an extension of UTAUT, also namely UTAUT2, to study the acceptance and use of technology in mobile application context from a consumer perspective. The UTAUT2 explained seven antecedents that affect the user intentions to use information systems and the subsequent actual usage. They are performance expectancy (PE), effort expectancy (EE), social influence (SI), facilitating conditions (FC), hedonic motivation (HM), price value (PV) and habit. Many researchers begun to adopt UTAUT2 to investigate user acceptance worldwide. For instances, Alalwan, Dwivedi & Rana (2017) found out that PE, EE, hedonic motivation (HM) and price value (PV) were crucial factors in affecting mobile bank in Jordan. This result is in line with the study of Baptista and Olivera (2015) which was conducted in wide range of African countries. Besides, UTAUT2 is used as main theoretical model to study a variety of new technologies or services in many countries such as Portugal, China, Spain, Malaysia etc. (Fortes et al. 2016; Gao et al. 2015; Herrero et al. 2017; Wong et al. 2014).

The definition of performance expectancy is the "degree to which a person believes that using the system will help him or her to achieve gains in working performance" (Venkatesh, 2003). In the con- text of TNCs, performance expectancy (PE) could reflect on working performance, since hailing a TNC car can save the time and monetary cost, whether going to or within work, by exempt individuals from the trouble of waiting for the car or finding parking space so that increase the efficiency of working performance. Also, taking a TNC car offer individuals the possibility to work in the car during itinerary, which as well as enhances the working performance of users. Hence, according to Venkatesh et al. (2012), we proposed the following hypothesis, H1

H1: *PE positively influence the Chinese user's acceptance of TNC.*

The definition of effort expectancy is the "degree of ease related with the use of the system" (Venkatesh, 2003). Actual explanation of effort expectancy mirroring on the reality situation could be the easiness the person feels less trouble and take less time when learning or operating the system. In the context of TNCs, effort expectancy (EE) could reflect on the degree of simplicity or difficulty users perceiving when using TNC app to hail a car and pay for the bill upon arrived. In a word, EE could be a friendly factor for IT savvy or a barrier for IT rookies. Hence, according to Venkatesh et al. (2012),

H2: *EE positively influence the Chinese user's acceptance of TNC.*

The definition of social influence is the "degree to which a person perceives that significant others believe he or she should use the new system" (Venkatesh et al. 2003). In other words, social influence means that using the system would bring you superiority among all the colleagues in the workplace or the people which you prone to having respect thinks that it is as necessary. In the context of TNCs, social influence (SI) means that users seem to be influenced or interested to the advices and opinions of their reference group (i.e. parents, relatives, friends and colleagues) in deciding to use TNC apps and services. Such influences can surely affect the user's intention to use TNC apps and services. Hence, according to Venkatesh et al. (2012),

H3: *SI positively influence the Chinese user's acceptance of TNC.*

The definition of facilitating conditions is "the degree to which a person believes that an organizational and technical infrastructure exists to support use of the system" (Venkatesh, et al. 2003). Facilitating conditions means that, in general, external resources including instruction knowledge or a group of stand-by assistants is perceived available for a person when using the system. In the context of TNCs, facilitating conditions (FC) is existed in a form of necessary resources that are indispensable for users

to use TNC apps and services successfully and effectively. Provided on the premise of missing resources such as mobile devices, mobile network, WiFi or mobile payment means, TNC is disabled anyhow. Because these resources are fundamental aspects before accessing TNC services. In addition, a group of user support is available dealing with technical difficulties and a clear instruction on how to use the TNC apps are both part of FC. Hence, according to Venkatesh et al. (2012),

H4: *FC positively influence the Chinese user's acceptance of TNC.*

The definition of hedonic motivation is "the fun or pleasure derived from using a technology, and it has been shown to play an important role in determining technology acceptance and use" (Brown and Venkatesh, 2005). In accordance with the definition, Van der Heijden (2004) deemed that perceived enjoyment centers on intrinsic motivation and is as well an important determinant of behavioral intention for using a hedonic information system. Therefore, perceived enjoyment can be considered as a vital role in predicting user acceptance. In addition, Thong, Hong & Tam (2006) testified the user's perceived enjoyment has a significant influence on users' satisfaction toward IT and even further affect the users' intention to use IT in terms of the various users' needs. In the context of TNCs, hedonic motivation (HM) can be considered as a perception of joy, entertainment, enjoyment and pleasure offers to users when using the TNC apps and services.

H5: *HM positively influence the Chinese user's acceptance of TNC.*

When UTAUT was firstly developed, Venkatesh did not take into consideration of users' perception toward the cost of a technology as the context is situated in workplace scenarios and usually the organizational employees tend to be quite insensitive in respect to the monetary cost. Bear that in mind, Venkatesh et al. (2012) incorporate price value as a factor in UTAUT2 and testified price value indeed have a significant influence on behavioral intention when "the benefits of using a technology are perceived to be greater than the monetary cost". IT services providers or developers should take into consideration what the most valuable point in the system is providing for customers. In the context of TNCs, price value (PV) could reflect on the fact if the TNC services is reasonable priced for the users. Generally, TNC charges considerably lower than local taxi fare and in most situations, have a cleaner and better car conditions due to the car is owned by the drivers. Therefore, the level of benefits and values perceived by users in using the TNC services is increasing, as well as user's intention to use TNC. Hence, according to Venkatesh et al. (2012),

H6: *PV positively influence the Chinese user's acceptance of TNC.*

Habit is delineated as a repetitive behavioral pattern that takes place automatically beyond the pale of the conscious awareness (Triandis, 1977). Prior researches suggested two types of understanding of habit in information system field. Kim, Malhotra and Narasimhan (2005) referred habit equivalently to automaticity and is in consistent with the term of "habitual goal directed consumer behavior" and "goal-dependent automaticity" from prior IS researches (Jasperson et al., 2005; Bagozzi & Dholakia, 1999; Bargh & Barndollar, 1996). On the other hand, Limayem et al. (2007) defined habit as the "degree to which people tend to perform behaviors automatically". Although it looks similar in both conceptualization, two authors had put habit into different practice. Kim and Malhotra (2005) considered habit as prior behavior and thus found out that habit is a significant antecedent for technology use. However, Limayem et al. (2007) measured habit as the "extent to which a person believes the behavior to be automatic". Subsequently, such measurement of habit has also been demonstrated that there is a positive relationship existed between habit and technology use as well as habit and behavioral intention (Limayem et al. 2007). Comprehensive above perspectives, both conceptualization and operationalization of habit are cooperating in predicting behavioral intention and use of technology. Therefore, habit was incorporated as a determinant into UTAUT2. Additionally, Venkatesh et al. (2012) suggested that, in the consumer context, habit plays a significant role on personal technology use especially under the circumstances which is miscellaneous and ever-changing. In the context of TNCs, habit could result in users using TNC apps and services repeatedly in users' daily lives. With the further growing of the dependence, users can be even addicted on TNC as main choice for transportation. Hence, according to Venkatesh et al. (2012),

H7: *Habit positively influence the Chinese user's acceptance of TNC.*

4 Research Methodology

4.1 TNCs in China

In 2015, a UCLA professor wrote an article named "Will China be Uber's Waterloo?", predicting the failure of Uber in China (Tang, 2015). One year later his prediction becomes reality. In the Chinese TNC market were Uber China, DiDi and the less significant Yidao. DiDi and Uber had different approaches in acquiring drivers for the supply side of their platforms. DiDi focused on existing taxi drivers. The Chinese startup actively pursued to convince a lot of existing taxi drivers to use their app. Financial incentives were provided. These actions were very effective to gain a large user base. Uber instead aimed to disrupt the existing taxi business by recruiting private car owners. (Wirtz & Tang, 2016). Despite subsidizing billions of USD and establishing local partnerships, Uber couldn't compete against the local competitor DiDi. As a result, Uber sold all assets in China including brand, data, and business to DiDi, and the two companies reached a strategic agreement, mutual holdings, become each other's minority shareholders, and most importantly, ended in an expensive price war. The sale of 'Uber China' to DiDi granted Uber a 20% stake in DiDi and a 1-billion-dollar investment from DiDi into Uber (Isaac, 2016). DiDi has a current market share of 94.6% as of March 2017 (Tao, 2017).

4.2 Data Collection and Analysis

The purpose of this study is to investigate the cause and effect relationships between UTAUT2 factors and user acceptance of TNC in China. This is the characteristic of explanatory study. Since the re- search purpose is clear, and the hypotheses were developed according to elaborately chosen theory, deductive approach is justified to use in this research (Saunders et al. 2009). The models used in this research, UTAUT2, have been widely appeared in large number of previous researches and a variety of hypotheses have been proposed and tested in the past. We choose UTAUT2 as referential theory because both practical and theoretical implications that UTAUT2 provided is suitable for TNC case. Next we developed 7 hypotheses respectively matching on with UTAUT2's powerful factors. Although the researches that have used UTAUT2 to apply in the case of TNC are extremely few, however it does not change the fact that clear hypotheses can be theorized and tested. Expectantly, by carrying out deductive approach, we are able to understand the casual relationship between UTAUT2 factors and user acceptance of TNC. Within the context of deductive approach, the survey strategy is often associated (Saunders et al. 2009) and thus becomes what we use. An internet-mediated survey was created with Microsoft Forms as a tool and distributed on Chinese social media using self-selection sampling. The aim was to get a diverse sample for high generalizability on the Chinese population.

In this study, Spearman's ranked correlation coefficient is used as it is ideal for the ordinal data from the employed Likert scale. Then the simple linear regression is used to test the relationship between each independent variable (UTAUT2 factors) and dependent variable user acceptance. The standardized coefficient beta value is the indicator reflecting the strength of the relationship ranging from –1 to 1. If beta value is 1, it means there is a perfect positive alignment of the independent and dependent variables and vice versa. If beta value is 0, it means there is no alignment at all. The coefficient of determination R^2 is measured to explain how much dependent variable can be explained by independent variable, ranging from 0 to 1.

5 Findings

The number of survey respondents is 361 which all required to answer all the questions for completion of the survey (n=361). 100% of the respondents were familiar with TNC usage and no answers had to be abandoned. 67.59% (244 out of 361) of the respondents have used DiDi, 50.41% Yidao, 38.23% Uber and 15.24% have used other smaller TNC. The average respondent had an experience with (Σ619:361=) 1.71 TNC. The gender distribution within the study was quite equal, showing a slight majority of female respondents (58% female vs. 39% male). The age distribution figure shows a

strong majority of 25 to 30-year-old respondents. Fewer are in the age groups of 18 to 25 and 30 to 45-year-olds with almost none over 45 and under 18-year-olds has interesting indications. Among occupation of respondents there's an equal strong majority of self-employed persons and employees (each 44%), while students and unemployed were underrepresented. The respondents were from approximately 43 different cities across 18 provinces in China. Major responses were gathered from the countries center cities like Beijing the capital in the North, Chengdu in the West, Shanghai in the East and Guangzhou in the South. Having these responses from different parts of the country with a sheer amount of cities grants the study a diverse sample.

In the reliability test, PE, EE, SI, FC, HM and Habit ended up higher than 0.7 in Cronbach's alpha test, which means the reliability of those factors are acceptable. As for the PV and UA, which even though ended up respectively in 0.694 and 0.669, because the values are very close to 0.7, we consider them are still acceptable in reliability.

Hypothesis 1 described that PE positively influence the Chinese user's acceptance (UA) of TNC. It can be seen that the Beta-value is 0.473, at significance level of 0.001, which proves that PE is a moderately positive predictor of the dependent variable UA. Therefore, H1 is legit. Using t-test to verify, a null hypothesis is created as follows.

$H1^0$ *: PE does not influence the Chinese user's acceptance (UA) of TNC*

$H1^1$ *: PE positively influence the Chinese user's acceptance (UA) of TNC*

The T-value is 10.159, which is larger than 6.3138 - the critical value at 1 degree of freedom, and thus the $H1^0$ can be rejected at the significance level of 0.05 for H1.

Hypothesis 2 described that EE positively influence the Chinese user's acceptance (UA) of TNC. It can be seen that Beta-value is 0s.458 at significance level of 0.001 which proves that EE is a moderately positive predictor of the dependent variable UA. Therefore, H2 is legit. Using t-test to verify, a null hypothesis is created as follows.

$H2^0$ *: EE does not influence the Chinese user's acceptance (UA) of TNC*

$H2^1$ *: EE positively influence the Chinese user's acceptance (UA) of TNC*

The T-value is 9.77, which is larger than 6.3138 - the critical value at 1 degree of freedom, and thus the $H2^0$ can be rejected at the significance level of 0.05 for H2.

Hypothesis 3 described that SI positively influence the Chinese user's acceptance (UA) of TNC. Beta-value is 0.464 at significance level of 0.001, which proves that SI is a moderately positive predictor of the dependent variable UA. Therefore, H3 is legit. Using t-test to verify, a null hypothesis is created as follows.

$H3^0$ *: SI does not influence the Chinese user's acceptance (UA) of TNC*

$H3^1$ *: SI positively influence the Chinese user's acceptance (UA) of TNC*

The T-value is 9.937 which is larger than 6.3138 - the critical value at 1 degree of freedom, and thus the $H3^0$ can be rejected at the significance level of 0.05 for H3.

Hypothesis 4 described that SI positively influence the Chinese user's acceptance (UA) of TNC. It can be seen that Beta-value is 0.526 at significance level of 0.001 which proves that SI is a moderately positive predictor of the dependent variable UA. Therefore, H4 is legit. Using t-test to verify, a null hypothesis is created as follows.

$H4^0$ *: FC does not influence the Chinese user's acceptance (UA) of TNC*

$H4^1$ *: FC positively influence the Chinese user's acceptance (UA) of TNC*

The T-value is 11.704 which is larger than 6.3138 - the critical value at 1 degree of freedom, and thus the $H4^0$ can be rejected at the significance level of 0.05 for H4.

Hypothesis 5 described that HM positively influence the Chinese user's acceptance (UA) of TNC. Beta-value is 0.617 at significance level of 0.001 which proves that HM is a moderately positive predictor of the dependent variable UA. Therefore, H5 is legit. Using t-test to verify, a null hypothesis is created as follows.

$H5^0$: HM does not influence the Chinese user's acceptance (UA) of TNC

$H5^1$: HM positively influence the Chinese user's acceptance (UA) of TNC

The T-value is 14.863, which is larger than 6.3138 - the critical value at 1 degree of freedom, and thus the $H5^0$ can be rejected at the significance level of 0.05 for H5.

Hypothesis 6 described that PV positively influence the Chinese user's acceptance (UA) of TNC. Beta-value is 0.548 at significance level of 0.001 which proves that PV is a moderately positive predictor of the dependent variable UA. Therefore, H6 is legit. Using t-test to verify, a null hypothesis is created as follows.

$H6^0$: PV does not influence the Chinese user's acceptance (UA) of TNC

$H6^1$: PV positively influence the Chinese user's acceptance (UA) of TNC

The T-value is 12.408, which is larger than 6.3138 - the critical value at 1 degree of freedom, and thus the $H6^0$ can be rejected at the significance level of 0.05 for H6.

Hypothesis 7 described that Habit positively influence the Chinese user's acceptance (UA) of TNC. The Beta-value is 0.567 at significance level of 0.001 which proves that Habit is a moderately positive predictor of the dependent variable UA. Therefore, H7 is legit. Using t-test to verify, a null hypothesis is created as follows.

$H7^0$: Habit does not influence the Chinese user's acceptance (UA) of TNC

$H7^1$: Habit positively influence the Chinese user's acceptance (UA) of TNC

The T-value is 13.038 which is larger than 6.3138 - the critical value at 1 degree of freedom, and thus the $H7^0$ can be rejected at the significance level of 0.05 for H7.

6 Discussion

To explore the factors and their influence on user acceptance of TNC in China, we draw the following implications based upon empirical findings and the existing literature on user acceptance:

According to our empirical findings ***Performance Expectancy*** has an intermediately positive relationship towards Chinese user acceptance of TNC. This factor elaborates the efficiency of transportation and everything it brings about. TNC usage is helpful and efficient in daily life. Such results are proven to be similar in conceptualization with respect to prior researches (Davis, 1989; Davis et al, 1989; Davis et al, 1992; Thompson et al, 1991; Moore and Benbasat, 1991; Compeau and Higgins, 1995; Compeau et al, 1999). The productivity that TNC enable stand in line with sharing economy's key component to provide access without need for ownership (Bardhi & Eckhardt, 2012); in this case for a car. Derived from empirical findings TNC usage is perceived as having acceptable waiting times. In accordance to the context of TNC in China it can be recommended that successful TNCs gain competitive advantage by reducing these waiting times through additional functions such as scheduling rides ahead or better driver coverage and saturation due to network effects of larger market shares. In addition, technological solutions such as algorithms for better distributions of drivers or navigation software to circumvent traffic jams should be investigated in.

Effort Expectancy as a factor has an intermediately positive influence on user acceptance of TNC in China. Our findings have confirmed that TNC users understand how TNCs work in general and find the

whole processes of using TNC easily. By the same definition, the findings are in accordance with several researches (Davis 1989; Davis et al, 1989, Thompson et al. 1991, Moore and Benbasat 1991). The findings confirm that connectivity (Benkler, 2007; Avital et al. 2015) through mobile devices allows for convenience in using services of sharing economy's platforms (Andersson, Hjalmarsson & Avital, 2013). Convenience has been found to be important for TNC users. Within this frame TNCs should focus on simplicity and accessibility. It is recommendable to provide a quick registration process for new TNC users with few steps and minimal information to fill. In addition, payments should be possible over all channels in a quick and secure manner i.e. cash, QR-code, NFC, credit cards, Alipay. From a user experience perspective, the app should have the same structure as similar apps to reduce the learning curve. Driver communication should also be enabled so that passengers can find the driver and the other way around.

The factor ***Social Influence*** ended up in showing an intermediately positive influence on user acceptance of TNC in China. This means that Chinese TNC users are seemingly more interested in the suggestions and opinions from their reference group (i.e. families, friends, co-workers) when deciding to use TNC or choose which TNC to use. This result of SI is parallel with the findings witnessed or defined in prior researches (e.g. Ajzen, 1991; Davis et al. 1989; Fishbein & Azjen, 1975; Taylor & Todd 1995; Thompson et al, 1991; Moore & Benbasat, 1991). That community has influence aligns with previous sharing economy items (Bardhi & Eckhardt, 2012; Marton et al., 2017). The reason why Social Influence playing a positive role in this case may be due to the particular Chinese cultural influence over the entire society. Family plays a major part in Chinese culture and the related philosophy was enlarged along with the historical progress to basically form every social interaction in Chinese society, covering relationship as parents to children, governor to civilian, husband to wife, elder brother to younger brother and friends to friends. Hence, the user acceptance of TNC can be largely reliant on word-of-mouth effect from people to people. As for the TNCs management, it is recommendable to build a strong positive social image or engage famous celebrities as spokespersons.

The empirical result of the factor ***Facilitating Conditions*** showed an intermediately positive influence on user acceptance of TNC in China. The result demonstrates that the TNC cannot success without having existence of certain facilities, resources, skills and even infrastructures. This result of FC is in line with the findings from previous researches (Fishbein & Ajzen, 1985; Taylor and Todd 1995; Thompson et al, 1991; Moore & Benbasat 1991). Facilitating conditions are essential to sharing economy and described as digital platforms in literature (Tells, 2016; Andersson et al., 2013). Facilitating Conditions are considerably concerned by Chinese TNC users. Indeed, the nature of TNC as a sophisticated information system requires fundamental enablers to have a smooth and effective access to the services such as internet access via 4G network or Wi-Fi, smart phones, sim card with a phone number, TNC applications and the most indispensable, the payment methods, which are either by credit card applications or mobile payment applications like Alipay or Wechat wallet in China. Interestingly, as reported by press that Uber in China lacks sufficient access channels for customer services, has been causing huge complaints from its customers who are both drivers and passengers. Because Uber provides only email access for customers to report their encountered troubles and from where to get feedback, which generally is too inconvenient given the fact that customers' problems with TNC are often needs to be resolved immediately or within short period of time. On the other side, DiDi pro- vides 24/7 telephone hotlines support respectively for drivers and passengers which significantly out- weighs that of Uber (DiDichuxing.com, 2017), potentially one of reasons that winning more market share than Uber.

As hypothesized, the factor ***Hedonic Motivation*** has been empirically proven to be positively influencing Chinese users' acceptance. In detail, the strength of the relationship is stronger, being slightly above intermediate. In comparison with the findings of prior research (Merriam-Webster, 2003; Van der Heijden, 2004; Thong et al. 2006), we can interpret that the acceptance of TNC can be increased by Chinese users which would feel joy, entertaining, pleasure or enjoyable from some novelties during the use of TNC. TNCs in China should consider improving the playfulness of their mobile applications as well as the entertainment during the ride; to make the customer journey a joyful and pleasant experience when escaping for a few moments from the hectic and noisy environment. It is probably because of intrinsic motivation has been playing a leading and significant role in the process of using a technology which encompasses of novelty seeking and uniqueness (Brown and Venkatesh, 2005; van der Heijden, 2004). As a result, for Chinese users, TNC as a quite novel technology or innovation, provided an added value in terms of modernism and entertainment.

Price Value has an intermediately positive effect on user acceptance of TNC in China, which was the second significant after Hedonic Motivation. This suggest that Chinese TNC users are very price sensitive when it comes to urban P2P transportation. This contrasts to Venkatesh's (2003) first version of UTAUT in which he claimed that there exists insensitiveness to monetary cost amongst employees. In the second version of UTAUT (Venkatesh, 2012) the factor Price Value got included as it was found to have significant influence on User Acceptance, just as in this study. Relating to existing sharing economy studies, price value plays a role as usage of idle resources decreases prices e.g. Benkler, 2004; Codagnone & Martens, 2016; Willing et al., 2016. TNC users are opportunistic, looking for low prices and high value. Subsidizing prices, as DiDi and Uber did, lead to higher market share and there- fore better user acceptance. It is likely using TNC for work-related transportation suggesting price competitiveness against alternative transportation i.e. taxis, subway, bus or own car. This means that in general TNC users perceive that the services are priced fairly, provide acceptable value while saving money as a transportation method. By providing subscription models with a fixed monthly fee in exchange for discounted rides price value for users can increase. In addition, TNC can benefit from a lock-in effect of users and an expected higher frequency of use.

The factor ***Habit*** has been shown to play an intermediate positive role in influencing the Chinese users' acceptance of TNC. As we can see, TNC has become the first choice of majority of Chinese users. In the light of two different conceptualization and operationalization of habit in information system field, we prone to believe that habit in this research is manifested as "habitual goal directed consumer behavior" or "goal-dependent automaticity" by Kim et al. (2005). According to Bargh et al. (2001), the conscious behavior is categorized by the mental representation such as why, what, and how like goals and interconnections among these goals. It is characteristic of Habit/Automaticity perspective (Aarts & Dijksterhuis, 2000; Verplanken et al. 1998). After constantly using the TNC over time, the same set of mental representations would likely be developed and knowledge structure would likely be established as well, ended up for Chinese users in automatically occurrence of using TNC without further thinking. Thus, we suggest that management of TNC should deliberate on change management especially when releasing new updates or implementing changes that would potentially affect behavioral patterns of their users. By these means, TNC will be able to improve the quality of services and meanwhile keep customers' habitual inertia. Considered the fact that TNC itself are still very young in nature, TNCs have to consolidate the user base and foster loyal users in the long term. In addition, arguably, habit could also be largely affected by past behavior, we call for future research to apply more moderators to measure habit in relevant research.

7 Conclusion

The digital shift in recent years resulted in disruption of the traditional business models. The new digitally enabled sharing economy's biggest unique market is China with TNCs being the largest industry. This industry has been subject to fierce competition and swift changes of market domination. This study's aim was to provide answers on how TNCs can be successful in China to understand the developments and underlying forces. For this, user acceptance was investigated in. As a tool, the state of the art UTAUT2 framework was employed, which is built upon previous user acceptance frameworks. A diverse quantitative sample was conducted in China, gathering information about respondents' attitude towards TNCs. Through Simple Linear Regression we found out that all seven factors; Performance Expectancy, Effort Expectancy, Social influence, Facilitating Conditions, Hedonic Motivation, Price Value and Habit; have an intermediately positive impact on user acceptance. Hedonic Motivation was found to have a slightly stronger impact than the other factors. These calculations were executed upon quantitative data from an electronically distributed survey with 361 responses from 43 different cities across 18 provinces in China. Upon analysis of the findings, research and practical implications are provided such as managerial recommendations for how TNCs can raise user acceptance and market share. Concluding it can be said that this study is the first in-depth user acceptance study on TNC in China, which was successfully executed and provides an adapted UTAUT2 model for the sharing economy.

The sample of this study's survey has high quality for generalizability, having data from diverse and representative respondents. A far larger number of respondents would be necessary for more accurate depictions on China's enormous population. UTAUT2 is a powerful framework, but is not depicting all influences. Empirical findings can be explored with more sophisticated statistical analyses i.e. structural equation modeling, confirmatory factor analysis or least partial squares.

Future studies could extend UTAUT2 with other potentially relevant factors such as "trust" and "privacy", as safety and data ethics may play a role for certain users. In the context of information system, user acceptance can be highly diverse, for instance, individuals which having higher status in the community, being unique in the group, feeling like taking control of their own and being skeptical towards outer world, are all worth investigating for. Another option for further research is an in-depth longitudinal study could get insight into the change of users' experiences with TNCs over time. Also, we suggest replications of this study on either TNC in different countries or on similar sharing economy industries such as accommodation-, bicycle-, gear-sharing and food delivery. Even TNC's have already expanded their business models to further services such as food delivery, car sharing and car- pooling. This could gather valuable information how UTAUT2 factors perform in different industries and cultures.

Acknowledgement

This paper is based on research work conducted by Yifan Chen and Wolfram Salmanian as part of their master thesis (both have contributed equally), and Dr. Asif Akram was thesis supervisor. The research work was conducted at department of informatic, Jönköping International Business School, Jönköping University, Sweden. The authors would like to acknowledge the facilitations provided by the University, especially Prof. Christina Keller, who has been supportive during the process. Last but not the least, the authors would like to thank Chalmers University of Technology for providing the opportunity to continue work on the paper and funding the conference participation.

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Appendix – Questionnaire Items from Survey

Performance Expectancy I perceive that TNCs are helpful in my life. I perceive that TNCs enable me quick transportation. I perceive that TNCs improve my life efficiency. I perceive that TNCs arrival time is acceptable. **Effort Expectancy** In my opinion, figuring out how to use TNC apps is not difficult. I generally understand how TNCs work. I perceive that TNC apps are convenient and easy to use. I perceive that it is easy to sign up on TNCs. I perceive that it is easy for me to contact the TNCs drivers and vice versa. I perceive that it is convenient and easy to pay for the ride. **Social Influence** I tend to use the TNC that my friends or families use. I perceive that by using TNC raises my prestige or image. Famous people could influence my decision to choose TNCs. People who cares about me could influence my intention to use TNC. **Facilitating Conditions** TNC apps on my smartphone is running smoothly. I'm aware that the instruction information about how to use TNCs is accessible for me. I perceive that to have the requirements (e.g. ID, credit card, Alipay) for signing up on the TNC apps is not a difficulty. I'm aware that the customer support of TNCs is available for me.	**Hedonic Motivation** I enjoy ordering a ride over the TNC apps. I enjoy taking a ride on TNC cars. I perceive that TNC drivers in general are talkative or easygoing persons. I like the gimmicks organized by TNCs (for festival activity or promotional campaign). I like to get surprised by what kind of vehicle model (e.g. Toyota or Tesla) it will be. **Price Value** I perceive that TNCs have a fair pricing. I perceive that TNCs provide acceptable value. I believe that I can save money by using TNCs as transportation. I perceive that TNCs have a high CP (cost performance). **Habit** Using TNC has been a habit of mine. I have to use TNC. I'm addicted to use TNC. Using TNC is my priority trip mode. **User Acceptance** TNC has been part of my life. Now I use TNC frequently. I think I will continue to use TNC. In future, I pursue to use TNC frequently.